Message

From: Lindstrom, Andrew [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=04BF7CF26AA44CE29763FBC1C1B2338E-LINDSTROM, ANDREW]
Sent: 5/2/2016 3:17:12 PM
To: Arlene Blum [arleneb@lmi.net]; Lau, Chris [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd4494e8927a4d78a5d2b9b20c618d4e-Lau, Chris]; Eileen Kramer [eileen@greensciencepolicy.org]
CC: Sara Petty [Eden@greensciencepolicy.org]
Subject: RE: Draft Webinar attached at last
Attachments: PFAS Terminology, Classification, and Origins 2011.pdf; KEMI Report-7-15-Occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf

Arlene and Eileen,

Thank you for the opportunity to review your slide show. It is beautiful.

Calling the PFAS Highly Fluorinated Chemicals is fine with me, but be prepared to cite the nomenclature document I've attached above. You don't need to get bogged down in the details of scientific naming convention.

Slide 4, the attached report from KEMI, the Swedish Chemical Authority states that there are likely to be more than 3000 PFAS in global commerce now.

Slide 5, while I'll immediately defer to Chris on this, I'd say "changes in liver function" (not malfunction) because a liver does lots of things in response to stress which are normal but do not necessarily lead to harm. I'd also say "changes in hormone levels" instead of "reduced hormone levels".

Slide 6, I'd say "Some highly fluorinated chemicals have no degradation pathways….." While the carbon fluorine bond is very strong, lots of PFAS have regions that are degradable – that's the reasoning behind the new polyfluorinated substitutes. Many of them don't look like they readily degrade either, but we don't have a lot of data on this yet. But PFOS and PFOA and related compounds will never degrade in nature – until they fall into a volcano or something like that.

Slide 10, the C8 or PFOA structure is correct, but C6 and C4 are not just simply shortened versions of C8. In this context, shorter refers only to a shorter perfluorinated region within the molecule – like 6 contiguous perfluorinated carbons in a "C6" replacement compound. The actual size of the replacement molecule may be as big or bigger (longer) than the material it is meant to replace, it just has few perfluorinated carbons. Also, the structures of some of the alternatives are trade secrets and some others have been fully disclosed.

Please let me know if I can help in any other way.

Andy

From: Arlene Blum [mailto:arleneb@lmi.net]
Sent: Friday, April 29, 2016 5:52 AM
To: Lau, Chris <Lau.Christopher@epa.gov>; Eileen Kramer <eileen@greensciencepolicy.org>; Lindstrom, Andrew <Lindstrom.Andrew@epa.gov>
Cc: Sara Petty <Eden@greensciencepolicy.org>
Subject: Draft Webinar attached at last

Chris and Andy,
Please see attached our Draft Webinar at last. It is confidential for now as we are still purchasing photos and making changes.
Please let us know if you see any inaccuracies or have suggestions for important information we have left out.
Many thanks as always for your invaluable help,
Arlene

At 04:04 PM 4/19/2016, Lau, Chris wrote:

> Eileen and Arlene:
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> Andy is a card-carrying Chemist, so Iâ€™ll defer the terminology to him.
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> For me, the choice of term depends if you want to be scientifically accurate or user friendly for the lay-person. The chemicals you are referring to in your talking points are perfluoroalkyl acids (PFAAs) that include PFOA, PFOS, C8, C6, C4, etc. They are part of the fluorochemical family (>2,000 strong, as you described), a great majority of which we have no clue about their source, application, exposure or health effects. The common term of â€œperfluorinated chemicalsâ€• (PFCs) includes perfluoroalkanes (without the functional group of sulfonate or carboxylate), which have different chemistry and applications from PFAAs. Scientists (especially toxicologists) prefer the precise use of â€œPFAAsâ€• in reference to PFOA, etc, but most in the public wonâ€™t be familiar with that term (they are used to C8, PFOA from the news media). Itâ€™s a dilemma. In addition, I am not so sure if all these 2000 fluorochemicals are indeed in commerce today (my guess is in the low hundreds), but we would like to find out more (some of them may be production byproducts or contaminants).
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> Hence, I would suggest the following:
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> 1. Start out with the generic term of fluorochemicals but refer specifically to PFAAs in describing uses and adverse effects of PFOA. PFOS, etc, about which we know more.
> 2. At the end, mention that there are more than PFAAs to worry about, i.e. the > 2000 fluorochemicals that we are beginning to detect in the environment but know very little about them.
> 3. Take-home message: minimize the use of PFAAs that we know are problematic, and investigate the rest of the lot to see which ones are less persistent and harmful.
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> Just my two cents.
>
> Chris
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> **From:** Eileen Kramer [mailto:eileen@greensciencepolicy.org]
> **Sent:** Tuesday, April 19, 2016 6:21 PM
> **To:** Lau, Chris <Lau.Christopher@epa.gov>; Lindstrom, Andrew <Lindstrom.Andrew@epa.gov>
> **Cc:** Arlene Blum <arlene@greensciencepolicy.org>
> **Subject:** Arlene/GSP webinar question
>
> Hi Andy and Chris,
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> Weâ€™re working through the webinar about fluorinated chemicals and weâ€™re still stuck on â€œhighly fluorinated chemicalsâ€• vs â€œfluorinated chemicalsâ€• vs

â€œfluorochemicals.â€• Arlene likes to use the shortest term with the fewest syllables. So, sheâ€™d like to use â€œhighly fluorinated chemicalsâ€• only when necessary for accuracy. Might you have time to take a quick look at the statements below to see if weâ€™re using the terms properly and if weâ€™re missing any opportunities to use shorter terms?

1) Iâ€™d like to tell you about highly fluorinated chemicals, or fluorochemicals. They contain multiple carbon-fluorine bonds, which are among the strongest bonds in chemistry. These bonds give the useful properties of stain- and water-repellency, but they also contribute to their extreme persistence and potential for toxicity.
2) More than 2,000 fluorochemicals are in commerce today. Their uses include carpeting and furnishings; indoor and outdoor clothing; cosmetics; nonstick cookware; food contact paper; fire-fighting foam; and building materials.
3) Human exposure to the most studied highly fluorinated chemicals has been linked to testicular and kidney cancer, high cholesterol, liver malfunction, and thyroid problems. Although most of the thousands of fluorochemicals have not been adequately tested for toxicity, they are all included on the list of priority chemicals for biomonitoring by the State of California.
4) Highly fluorinated chemicals have no known degradation pathways in the environment, and can persist for geologic time, which can be *millions* of years. Worldwide, our water, land and air are more and more contaminated with these toxic molecules.
5) Fluorochemicals are manmade. They do not occur in nature. When they are present, it is because we make them, use them, and dispose of them. We are exposed from products in our homes, and food and drinking water contaminated with these chemicals. Childrenâ€™s developing brains and bodies are especially vulnerable to these exposures.
6) Highly fluorinated chemicals containing eight carbons surrounded by fluorine atoms are known as â€œC8â€• . After decades of research showed the C8â€™s extreme persistence and toxicity, industry replaced them with smaller but similar molecules called C6 and C4 containing six and four carbons respectively. There are dozens of forms of C6 and C4 whose chemical structures are protected as â€œconfidential business information." Limited information suggests they also persist in the environment, are found at increasing levels in humans, and are associated with health harm similar to C8.